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The Excessive Profits of Defense Contractors: Evidence and Determinants

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Research Questions

- Q1: Do defense contractors earn excessive profits at the expense of taxpayers?
- Q2: If yes, what are the determinants of excessive profits?

Do Defense Contractors Earn Excessive Profits?

- No consensus among academics, government, elected representatives, and the industry.
- The Aerospace Industries Association (AIA), has consistently insisted that “Defense industry profitability lags significantly behind its industry peers.”
- A General Accounting Office (GAO) report in 1980s found that defense contractors normally earned a higher Return On Assets (ROA) than their commercial counterparts.
- In 2009, a Department of Defense (DoD) sponsored project carried out by the Institute for Defense Analysis (IDA) confirms that the operating margin of defense industry is lower than that of other sectors. However, the profit is “adequate” to sustain defense industry firms because they enjoy a more favorable financing structure.
- What does the academic literature (assuming academics are relatively independent and hence are less subject to a conflict-of-interest problem) say about this controversial issue?

The Literature Review on the Excessive Profits of Defense Contractors

- Early evidence was mixed.
Weidenbaum (1968), Bohi (1973),
Agapos and Galloway (1970), Stigler and Friedland (1971).
- The studies in the 1980s and 1990s are less divided in that generally they support the proposition that defense industries earn higher profits than their non-defense peers.
Carrington (1986), Trueger (1991), Lichtenberg (1992).
- The major explanation of the excessive profits is the cost-shifting hypothesis, though a more recent 2002 study casts doubt on the validity of this explanation.
Rogerson (1992), Thomas and Tung (1992). McGowan and Vondrzyk (2002)
- The academic studies on the profitability of defense contractors almost stopped after 1990s, leaving an almost two decade blank.

The Objective of This Paper

- First, we fill in an almost two-decade gap that was left blank by the literature, i.e., we use up-to-date data to investigate whether defense contractors earn excessive profits. Our contribution to this goal is beyond a pure extension of timeline. Namely, we employ an innovative industry-year-size matched excessive profit measure to better capture the “excess” of the defense contractors’ profitability.
- Secondly, given that we have found the evidence supporting the existence of excessive profits and the lack of consensus on the explanations of excessive profits, we provide alternative determinants of excessive profitability.

Data

- fedspending.org: Top 500 recipients (by dollar awarded) of defense contract awards for year 2008.



Of which we find

- 112 publically traded firms, covering 24 unique industry sectors as defined by 2-digit SIC.



Using stock tickers to map into the Compustat database

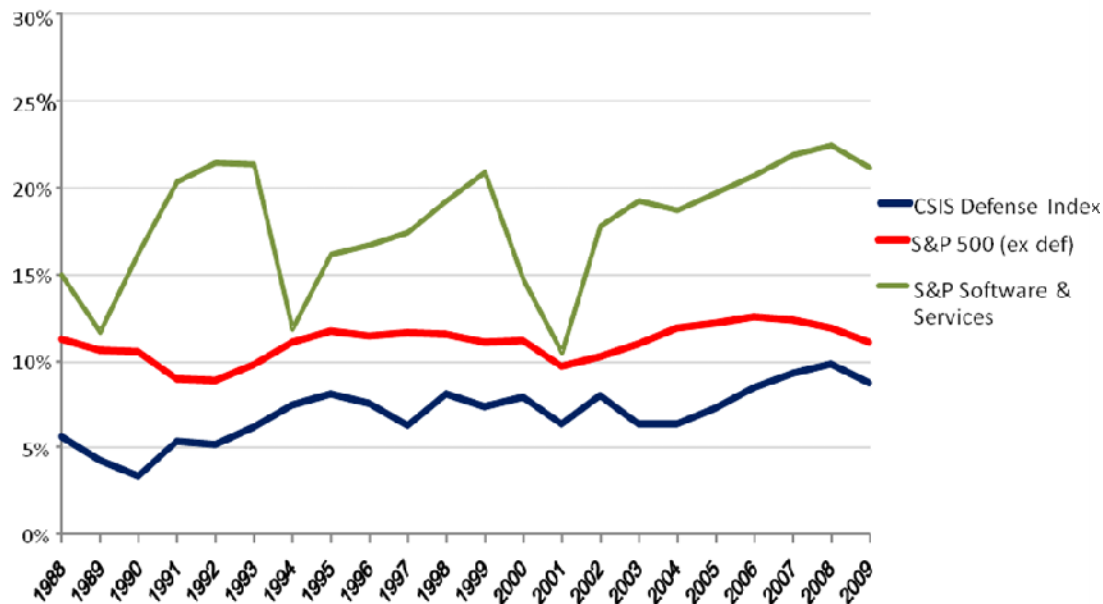
- 4,099 sample firm-years during 1950-2010

Research Design: Measuring Excessive Profits

What Does Not Make Sense?

- A very common and seemingly sensible method is to compare the profitability measures of defense contractors with similar measures of the member firms of an index.

**Figure 1: Defense Industry Operating Margin—
the Lowest Returns Amongst Its Peers (Reproduced from AIA report)**



Critique of “Defense vs. S&P Index “ Approach

Why Not Make Sense?

- Q: What implications concerning defense contractors’ excessive profits, if any, can be drawn from the Figure 1?

Our answer: None!

- It’s meaningless to use a very broadly defined index as the benchmark for inferring the defense contractors’ normal profitability. The defense contractors, as a whole or as individual firms, and the broad market, are two different animals.
- Even a narrowly defined index, such as a manufacturing index, is also problematic. The bottom line is: the defense contractors span a wide range of industries. For instance, our 112 public U.S. firms on the 2008 top 500 list cover 24 unique 2-digit-SIC codes. If measured by 4-digit-SIC codes, the number goes up to 56 industries!
- As pointed out by McGahan and Porter (2002), profitability is very industry-specific. Different industries have different risk exposures, competitions, and entry barriers, among many others. Therefore given the wide industry representation of defense contractors, the correct benchmark for inferring defense contractors’ normal profitability (and hence excessive profitability) must focus on the individual firm level.
- There is no one-size-fits-all benchmark, not the S&P, not a manufacturing index, not any readily available index.

Research Design: Measuring Excessive Profits

What Does Make Sense?

- Based on the theoretical literature, we propose an ***industry-year-size*** matched measure to assess the excessive profitability of defense contractors.
 - McGahan and Porter (2002) document the importance of year and industry on accounting profitability.
 - Extensive literature demonstrates that firm size should be considered in constructing a benchmark for comparison (Albuquerque 2009, Dechow, Hutton, and Sloan 1996).
 - Hence, we devise an industry-year-size matched excessive profit measure for each individual firm-year and in turn use it as the basis for analyzing our research questions.

Measuring Excessive Profits: Industry-Year-Size Matched Proxy

- For each of the 4,099 firm-years, we try to find a benchmark firm-year whose profit becomes the proxy for “normal profit” of the firm-year investigated.
- Specifically, we go to *the same industry-year* where industry membership is defined as 4-digit SIC codes, and identify the *non-defense* (i.e., not on our 112-firm list) firm that has the best size match (where size is alternatively defined as either total assets or total revenue) with our defense firm-year.
- The difference between the profit of the firm-year investigated and the profit of the benchmark firm-year will be the measure of “excessive profit”.

Empirical Results

- Table 5 The Excessive Profitability of 4,099 Firm-Years during 1950-2010

Panel A: Size matched by Total Assets

	N	Mean	Min	Max	Std Dev	t	P-value
Excessive ROA(%)	3,809	1.12	-23.49	44.17	7.08	9.77****	<0.0001
Excessive ROCE(%)	3,314	3.65	-143.64	175.57	25.73	8.08****	<0.0001
Excessive PMR(%)	3,809	0.28	-31.82	74.56	7.87	2.22**	0.03
Excessive OMR(%)	3,777	-0.09	-59.59	257.33	10.32	-0.52	0.60

Panel B: Size matched by Total Revenue

	N	Mean	Min	Max	Std Dev	t	P-value
Excessive ROA(%)	3,825	1.04	-21.89	44.37	7.29	8.80****	<0.0001
Excessive ROCE(%)	3,246	3.71	-142.09	178.70	26.08	8.10****	<0.0001
Excessive PMR(%)	3,825	0.45	-31.82	74.91	7.23	3.85***	0.0001
Excessive OMR(%)	3,793	0.35	-48.23	69.29	7.80	2.77***	0.006

Empirical Results (cont'd)

- Table 6 The Excessive Profitability Increased After 1992

Independent Variables	Dependent Variable: Industry-Year-Size Matched Excessive Profit							
	Size matched by Total Assets				Size matched by Revenue			
	ROA (N=3,307)	ROCE (N=3,307)	PMR (N=3,307)	OMR (N=3,307)	ROA (N=3,352)	ROCE (N=3,352)	PMR (N=3,352)	OMR (N=3,352)
Intercept	0.0072	0.0505	-0.0003	-0.0034	0.0048	0.0589	-0.0009	0.0012
Post-1992 Dummy (t-value)	0.0076*** (2.99)	0.0053 (0.57)	0.0048* (1.69)	0.0006 (0.16)	0.0097*** (3.68)	-0.0074 (-0.63)	0.0077*** (2.96)	-0.0020 (-0.72)

Empirical Results (cont'd)

- Table 7 The Excessive Profitability and Corporate Governance

Independent Variables	Dependent Variable: Industry-Year-Size Matched Excessive Profit							
	Size matched by Total Assets				Size matched by Revenue			
	ROA (N=3,307)	ROCE (N=3,307)	PMR (N=3,307)	OMR (N=3,307)	ROA (N=3,352)	ROCE (N=3,352)	PMR (N=3,352)	OMR (N=3,352)
Intercept	0.0097	0.0528	0.0003	-0.0041	0.0087	0.0491	0.0015	-0.0005
CEO-Chairman Duality Dummy (t-value)	0.0084** (2.48)	0.0062 (0.60)	0.0116*** (3.06)	0.0055 (1.12)	0.0076** (2.18)	0.0048 (0.46)	0.0098*** (2.84)	0.0035 (0.97)
Board Size (t-value)	-0.0004 (-0.38)	0.0192 (0.76)	-0.0007 (-0.50)	0.0011 (0.88)	-0.0004 (-0.41)	0.0005 (0.42)	0.0005 (0.41)	0.0023** (2.01)
Board Independence (t-value)	-0.0132 (-0.76)	-0.0237 (-0.56)	-0.0140 (-0.62)	-0.0151 (-0.69)	0.0014 (0.08)	-0.0263 (-0.46)	-0.0143 (-0.72)	-0.0172 (-0.90)

Summary of Major Findings

- First, when compared with their industry peers, defense contractors earn excessive profits. This result is evident when profit is measured by Return on Assets (ROA), Return on Common Equity (ROCE), and Profit Margin Ratio (PMR). The evidence of excessive profit is less consistent if profit is measured by Operating Margin Ratio (OMR).
- Secondly, defense contractors' excessive profit is more pronounced after 1992, consistent with the conjecture that the post-1992 significant industry consolidation enabled superior profitability due to both the improved bargaining power and increased political influence of the newly combined firms.
- Finally, defense contractors' excessive profitability increases with poorer corporate governance, as measured by the duality of the Chief Executive Officer (CEO) and the Chairman of the Board.

Questions? Comments? Suggestions?